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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,362	02/07/2005	Agnes Chardonens	13311-00012-US	1864
23416 7590 07/18/2008 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899				
EXAMINER				
KUMAR, VINOD				
ART UNIT		PAPER NUMBER		
1638				
MAIL DATE		DELIVERY MODE		
07/18/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/523,362

Applicant(s)

CHARDONNENS ET AL.

Examiner

VINOD KUMAR

Art Unit

1638

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5,8-11,13,15,18,19,29,32,47 and 49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5,8-11,13,15,18,19,29,32,47 and 49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 May 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 2/11/2008
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 13, 2008 has been entered.

Status of objections and rejections

2. Claims 1, 5, 8-11, 13, 15, 18-19, 29, 32, 47 and 49 are pending.
3. Claims 2-4, 6-7, 12, 14, 16-17, 20-28, 30-31, 33-46 and 48 are cancelled.
4. Claims 1, 5, 8-11, 13, 15, 18-19, 29, 32, 47 and 49 are examined on merits in the present Office action.
5. Objection to claims 1 and 18 has been withdrawn in light of claim amendment filed in the paper of May 13, 2008.
6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
7. Rejections of claims 1, 5, 8-11, 13, 15, 18-19, 29, 32, 47 and 49 under 35 U.S.C. 112, 1st paragraph have been withdrawn in light of claim amendment and persuasive arguments filed in the paper of May 13, 2008.

Election/restriction

8. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

9. Claims 18 and 29 are objected due to following informalities:

Claim 18 is objected for deleting the functional language associated with the polypeptide with at least 95% identity to SEQ ID NO: 4.

Claim 29 is objected for not deleting "as" after "sequence" in line 3 of part b) of the claim.

These objection have been necessitated due to the claim amendment filed in the paper of May 13, 2008.

Double Patenting

10. Claims 1, 5, 8-11, 13, 15, 18, 19, 29, 32, 47 and 49 remain provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 2, 10, 11, 12, 15, 16, 19, 22, 23 and 24-27 of co-pending Application No. 11/251,208. Although the conflicting claims are not identical, they are not patentably distinct from each other for the reasons of record stated in the Office action mailed on November 3, 2006.

Applicant's response filed in the paper of May 13, 2008 states that Applicant proposes to file terminal disclaimer upon the indication of allowable subject matter (response, pg 6, lines 18-21). Accordingly, the rejection is maintained.

Claim Rejections - 35 USC § 103

11. Claims 1, 5, 8-11, 13, 15, 18-19, 29, 32, 47 and 49 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Gan (Biochem. Biophys. Res. Comm., 187:949-955, 1992) in view of Valvekens et al. (PNAS, 85:5536-5540, 1998) and Grant et al. (Biochimica et Biophysica Acta, 1490:33-42, 2000) for the reasons of record stated in the Office action mailed on January 25, 2007 and November 14, 2007. Applicant traverses the rejection in the paper filed on May 13, 2008.

Applicant argues that Gan does not teach or suggest a transgenic plant with a nucleic acid sequence encoding instant SEQ ID NO: 4. Applicant further argues that Grant et al. do not teach or suggest that a transgenic plant expressing yeast GRX2 would exhibit improved tolerance to stresses (response, pg 9, lines 10-19). Applicant further argues that although yeast and plant are both eukaryotic organisms but due to difference in genome size and protein coding genes between plant and yeast, a yeast gene identified in yeast would not function in a plant (response, pg 10, lines 3-19). Applicant further argues that references when combined do not clearly establish that the yeast GRX2 (SEQ ID NO: 4) may play a role in protecting against oxidative stress in yeast cells and thus it is unpredictable that a transgenic plant expressing yeast GRX2 would exhibit improved tolerance to stresses. Applicant further argues that absent the hindsight, it could not have been predicted that transforming plant cell with yeast GRX2

would have resulted in stress tolerant transgenic plant cell and plants derived thereof (response, pg 10, lines 20-29).

Applicant's arguments have been carefully considered but are deemed to be unpersuasive.

It is maintained that it would have been obvious and within the scope of an ordinary skill in the art to express a nucleic acid sequence encoding glutaredoxin protein of Gan in any host including a plant (monocot or dicot) host using any plant transformation method including the one taught by Valvekens et al. to arrive at the instantly claimed invention with a reasonable expectation of success.

It is further maintained that given Grant et al. teach that glutaredoxin proteins (same as taught by Gan) are implicated in protecting a cell against environmental stresses, one of ordinary skill in the art would have been motivated to express Gan nucleic acid sequence encoding glutaredoxin protein in any eukaryotic host cell including a plant cell to produce a stress-tolerant transgenic plant cell or plant with a reasonable expectation of success.

In response to Applicant's arguments, it is important to note that it was well known in the art at the time the instantly claimed invention was made that yeast genes can be successfully expressed in plants to obtain expected phenotype. See for example, Romero et al. (Planta, 201:293-297, 1997; see in particular, pg 293, abstract; pg 294, figures 1 and 2; pg 295, figure 3, table 1; pg 295, figures 4 and 5) who teach drought tolerant transgenic tobacco plants expressing yeast trehalose-6-phosphate synthetase gene. Also see, Samuelsen et al. (Plant Physiol. 118:51-58, 1998; see in

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particular, pg 51, abstract; pg 54, figures 1 and 2; pg 55, figure; pg 56, figures 4 and 5) who teach transgenic tobacco plants overexpressing yeast FRE (Fe(III) reductase gene resulted in improved iron efficiency in said plants.

Given, it was well known in the art at the time the instantly claimed invention was made that yeast genes can be overexpressed in a plant to produce an expected phenotype, it would have been obvious and within the scope of an ordinary skill in the art to try to over-express Gan's Oxidoreductase coding sequence in a plant for the purpose of obtaining environmental (salt, drought etc.) stress tolerant transgenic plant with a reasonable expectation of success.

It is further maintained that it would have been obvious and within the scope of an ordinary skill in the art to use Gan nucleic acid sequence encoding the glutaredoxin protein as a DNA marker in any DNA hybridization based technique, such as Southern blot or DNA dot blot analysis to identify stress-tolerant transgenic plant with a reasonable expectation of success.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, one of ordinary skill in the art would have arrived at the instantly claimed invention with a reasonable

expectation of success by combining the teachings of Gan, Valvekens et al., and Grant et al.

It may be noted that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In the instant case, one of ordinary skill in the art would have arrived at the instantly claimed invention with a reasonable expectation of success by combining the teachings of Gan, Valvekens et al., and Grant et al.

For at least these reasons and the reasons of record stated in the previous Office Action, it is maintained that the claimed invention as a whole is prima facie obvious over the combined teachings of the prior art.

Conclusions

12. Claims 1, 5, 8-11, 13, 15, 18-19, 29, 32, 47 and 49 remain rejected.

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinod Kumar whose telephone number is (571) 272-4445. The examiner can normally be reached on 8.30 a.m. to 5.00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Phuong T. Bui/

Primary Examiner, Art Unit 1638